



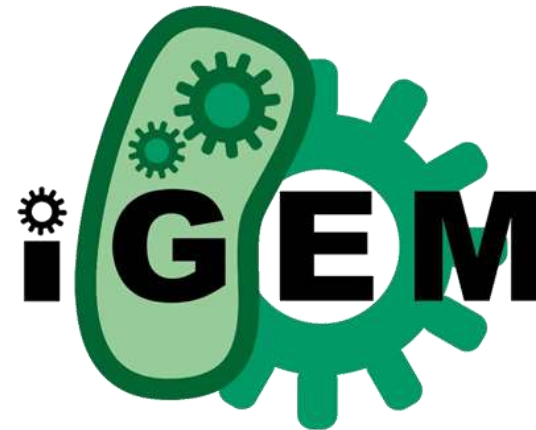
**TU/e**

Technische Universiteit  
**Eindhoven**  
University of Technology

Where innovation starts

# iGEM

- International Genetically Engineered Machine competition

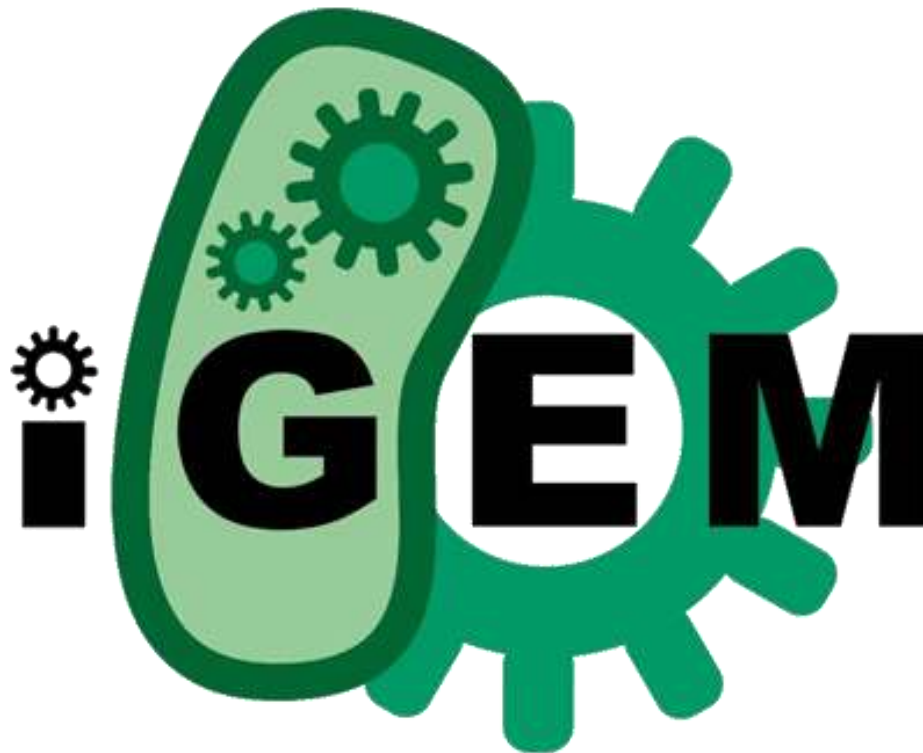


- Competitie voor studenten in Synthetische Biologie



# Doel iGEM competitie

Bouwen van biologische systemen en deze werkend krijgen in levende cellen.



# Doel iGEM competitie

- “BioBricks”





# Doel iGEM competitie

- Spelen met BioBricks



# Doel iGEM competitie

- Ingenieurs (in opleiding) bouwen met BioBricks





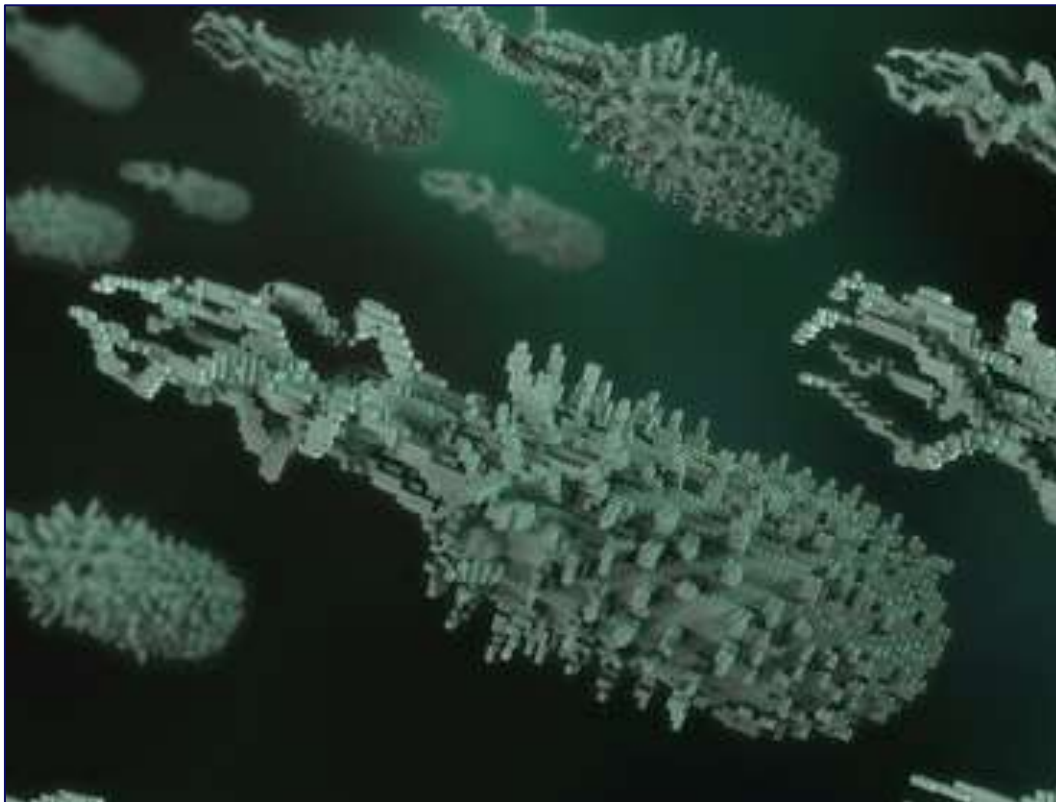
# Doel iGEM competitie

- **Resultaat**



# Doel iGEM competitie

- Resultaat in praktijk

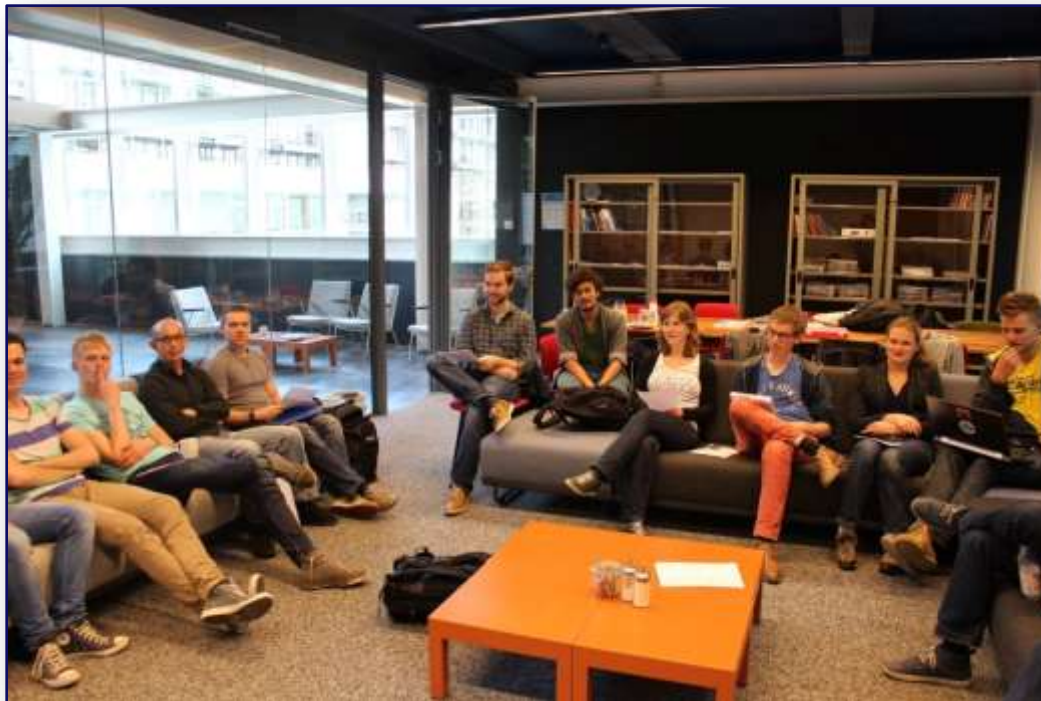




# iGEM in praktijk

**Januari – juni:**

- **Brainstormen**
- **Bestellen, plannen en uitwerken**



# iGEM in praktijk



# iGEM in praktijk



**Zomer 2014**

- **Dan kan het labwerk starten!**

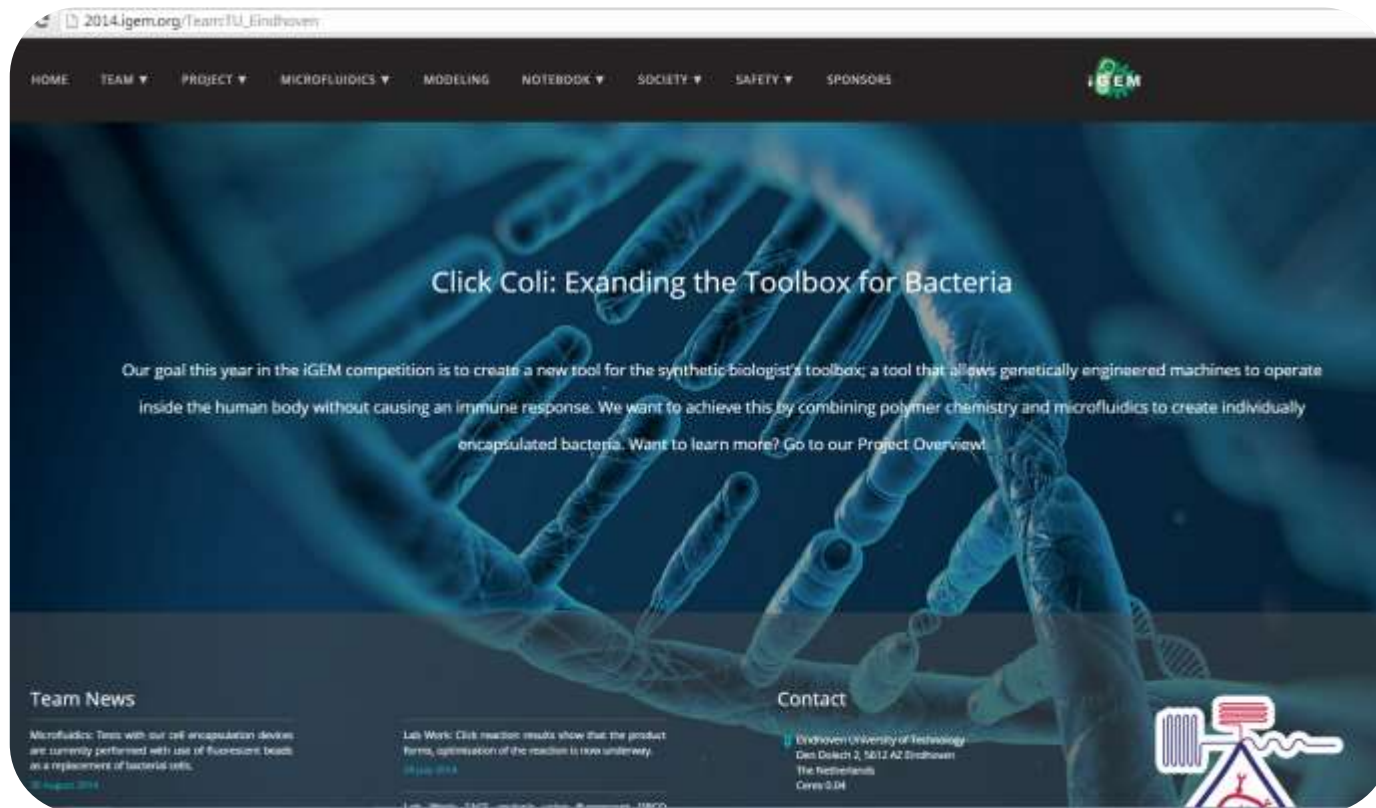




# iGEM in praktijk

- Resultaten op website

[http://2014.igem.org/Team:TU\\_Eindhoven](http://2014.igem.org/Team:TU_Eindhoven)



# Giant Jamboree

- 30 oktober – 3 november
- Boston, Verenigde Staten



**G I A N T 20**  
**J A M B O R E E 14**

October 30 - November 03  
Hynes Convention Center  
Boston, MA

**The Synthetic Biology event of the year!**

With over 2,500 Synthetic Biology researchers from 245 universities across 32 countries in attendance, the Giant Jamboree is sure to be the largest gathering of synthetic biologists to date. The Giant Jamboree celebrates university students as they showcase their achievements in Synthetic Biology at the iGEM Synthetic Biology competition.



# Giant Jamboree

- 5 dagen
- 245 teams
- 2500+ deelnemers





# Tracks



# Track: new application

- “Nieuwe toepassing”



## New Application

New Application is an apt description for a track that doesn't have a common problem, or focus tying all projects together. It is the novelty of ideas and approach in investigating a question that may never have previously been examined that qualifies a project in the New Application track.



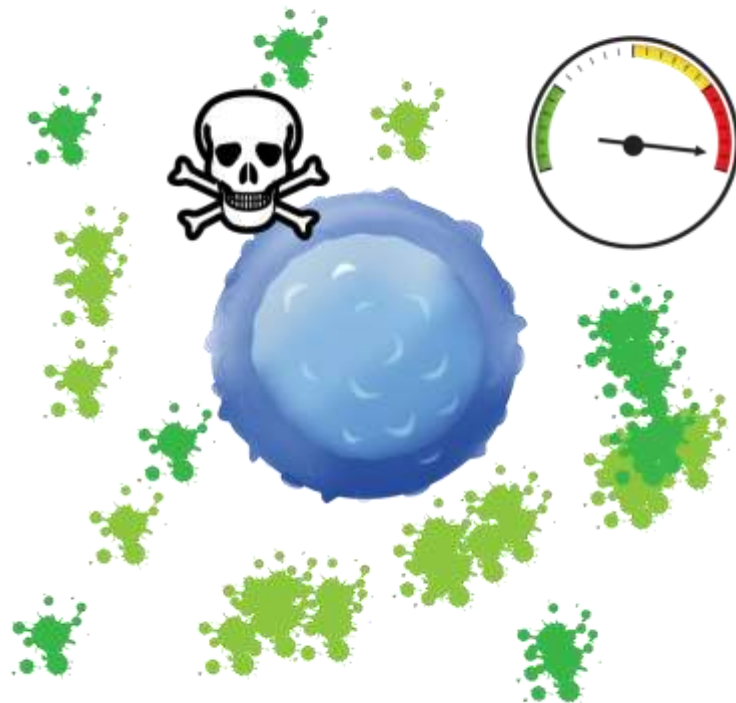
# iGEM projecten

- **BactoBlood**                      **alternatief voor rode bloed cel**
- **Shining Sanctifier**                      **waterzuivering**
- **MRiGEM**                      **contrastvloeistof MRI**
- **Bee. Coli**                      **Red de bij!**
- **Taxi.Coli**                      **slimme medicijn afgifte**
- **Cardiobiotics**                      **Hartproblemen**





# Probleem



# Oplossing

## Click Coli:

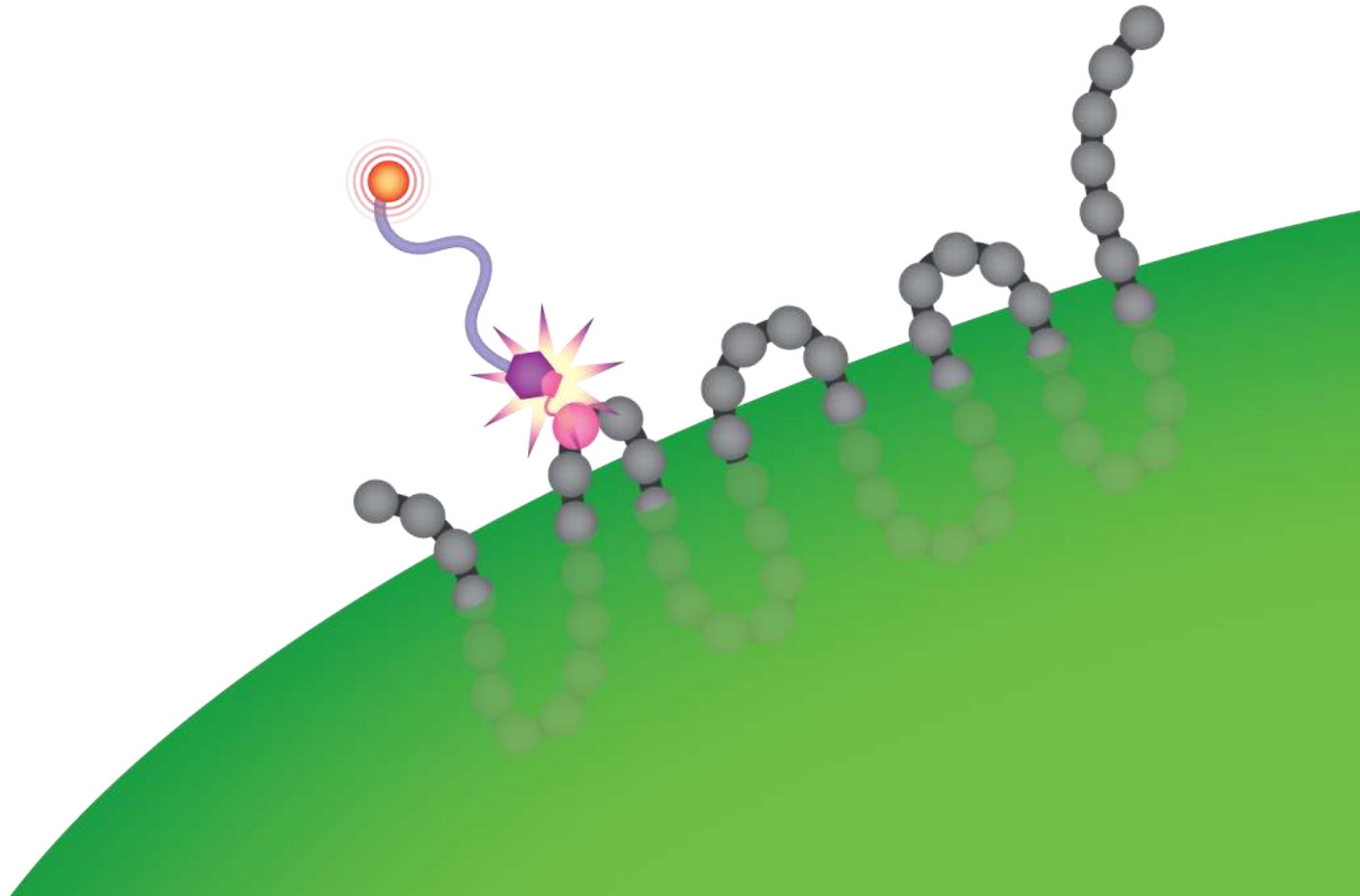
- *E. Coli* bacteriën waaraan iedere chemische groep “geklikt” kan worden
- Mogelijk om beschermende laag om bacterie te maken



- Uitbreiding van de chemische gereedschapskist van de synthetische biologie

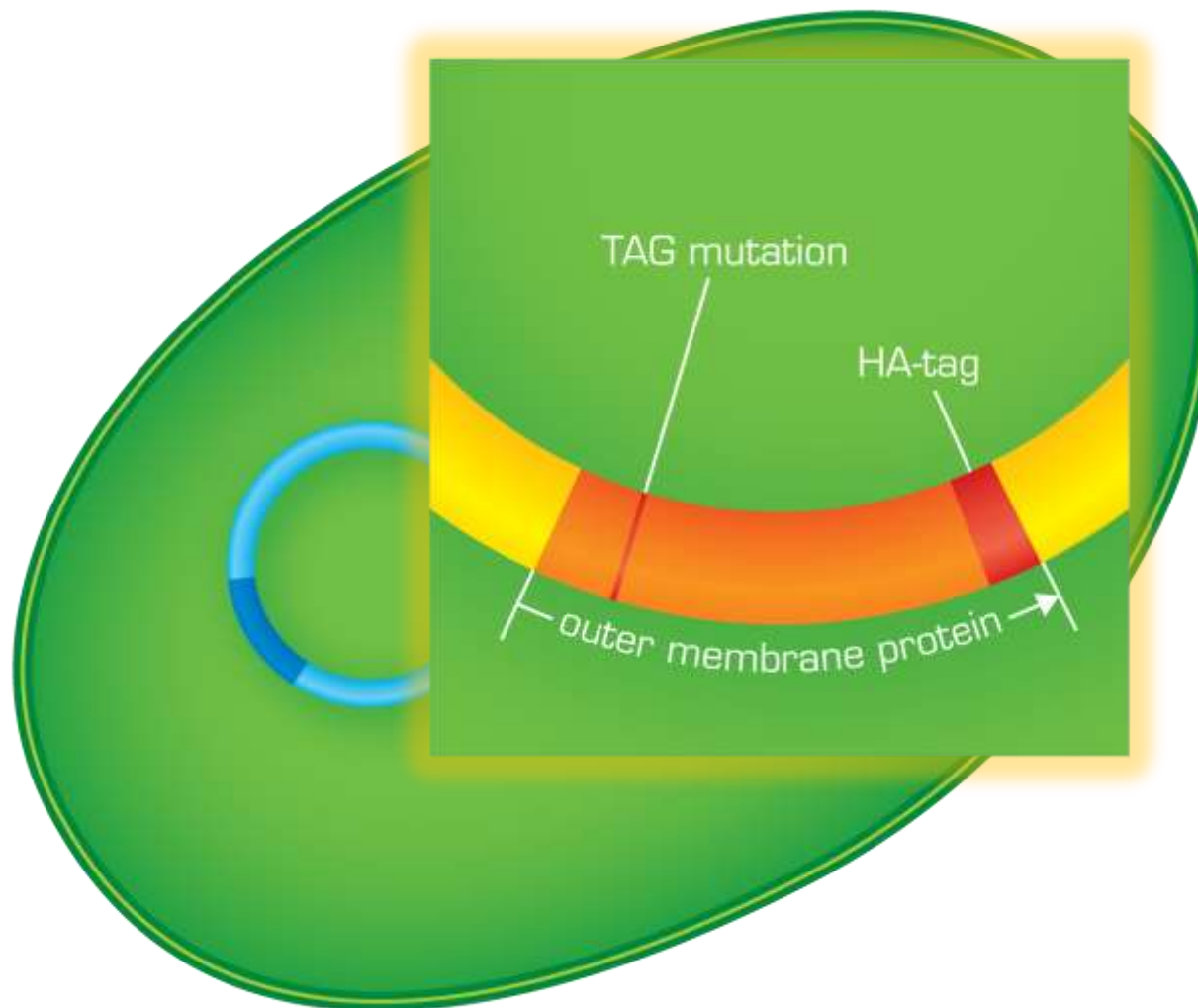


# Klikbaar Membraaneiwit

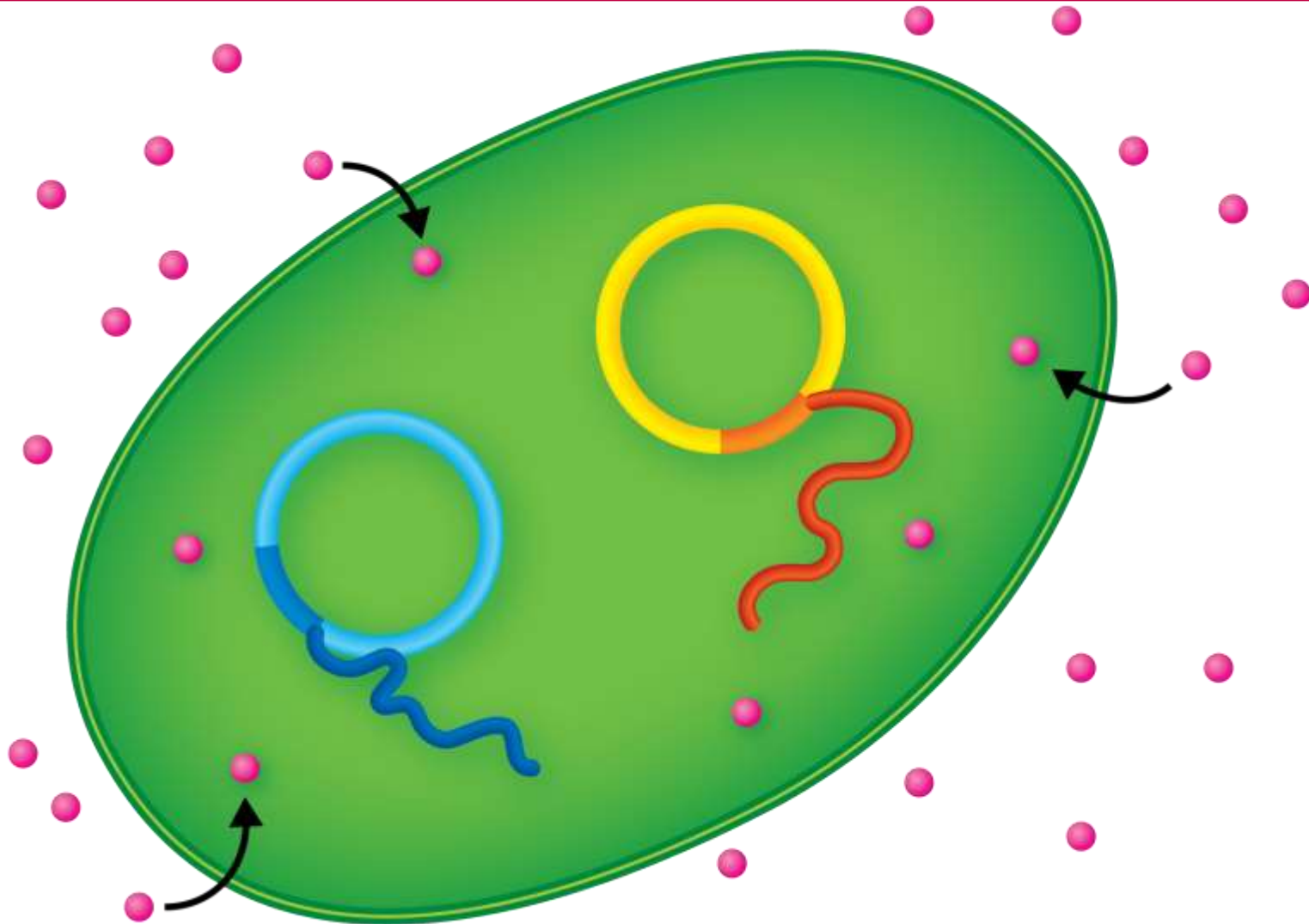




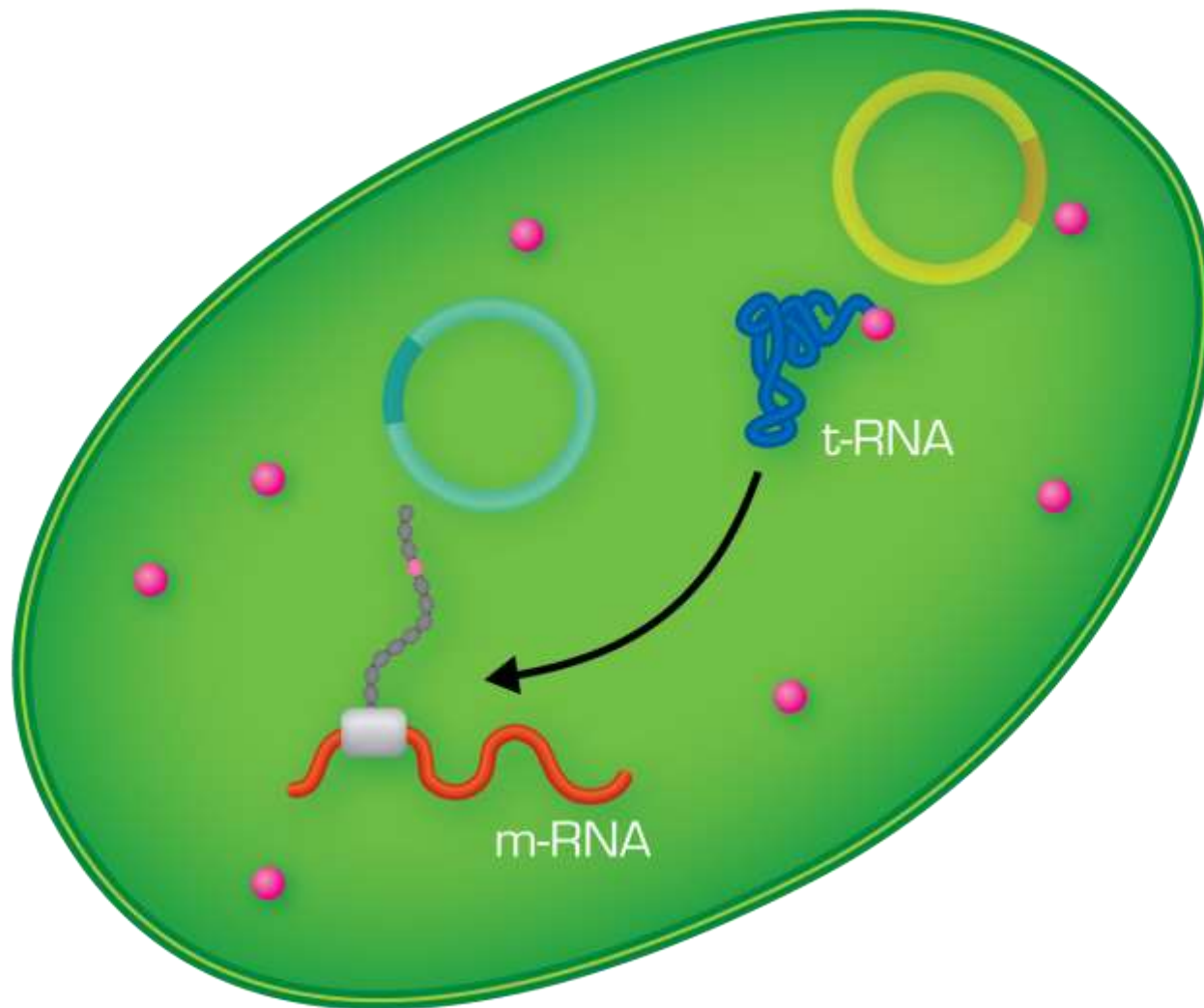
# Genetische Modificatie



# Toevoegen niet natuurlijk aminozuur

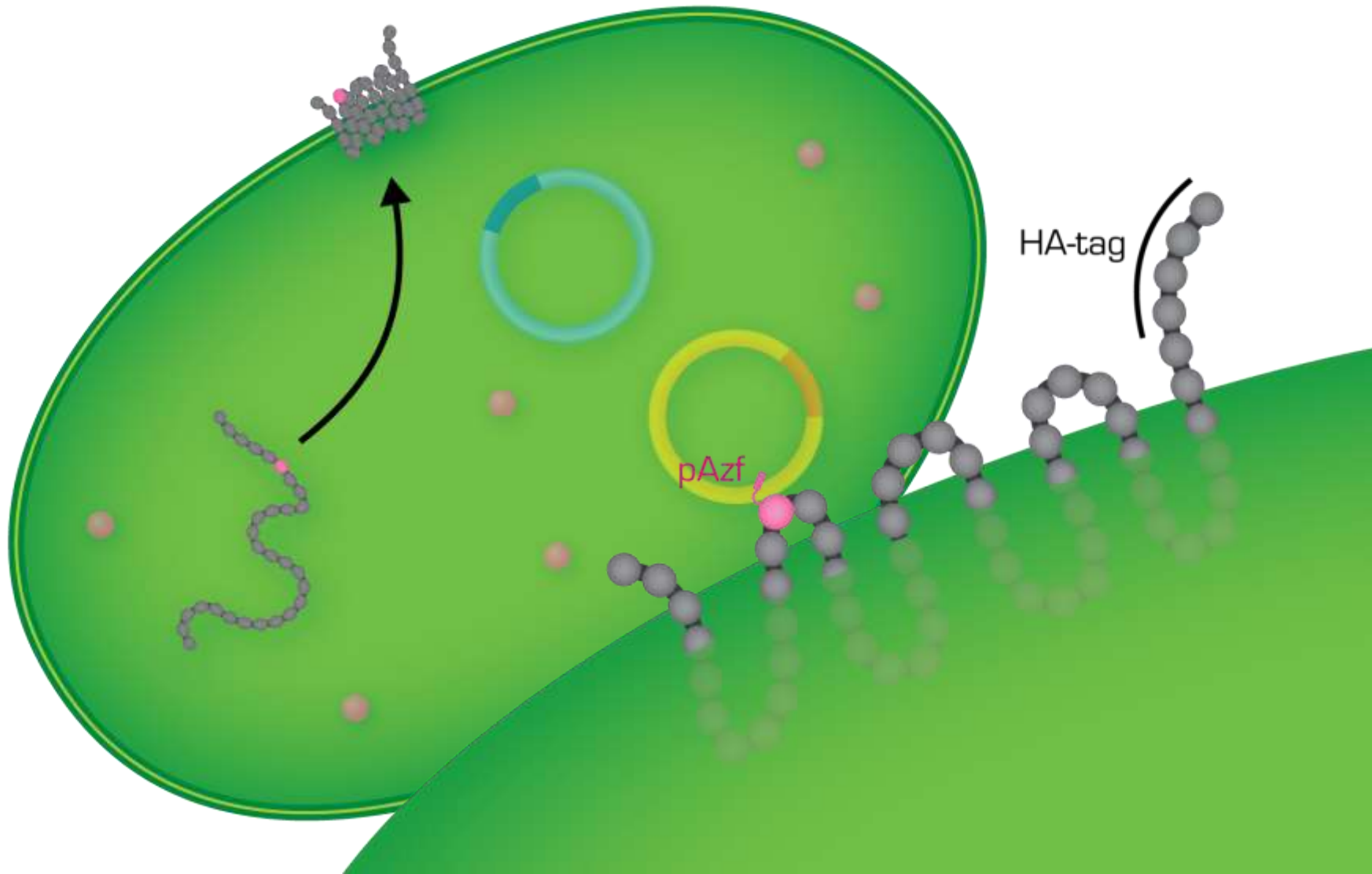


# Translatie

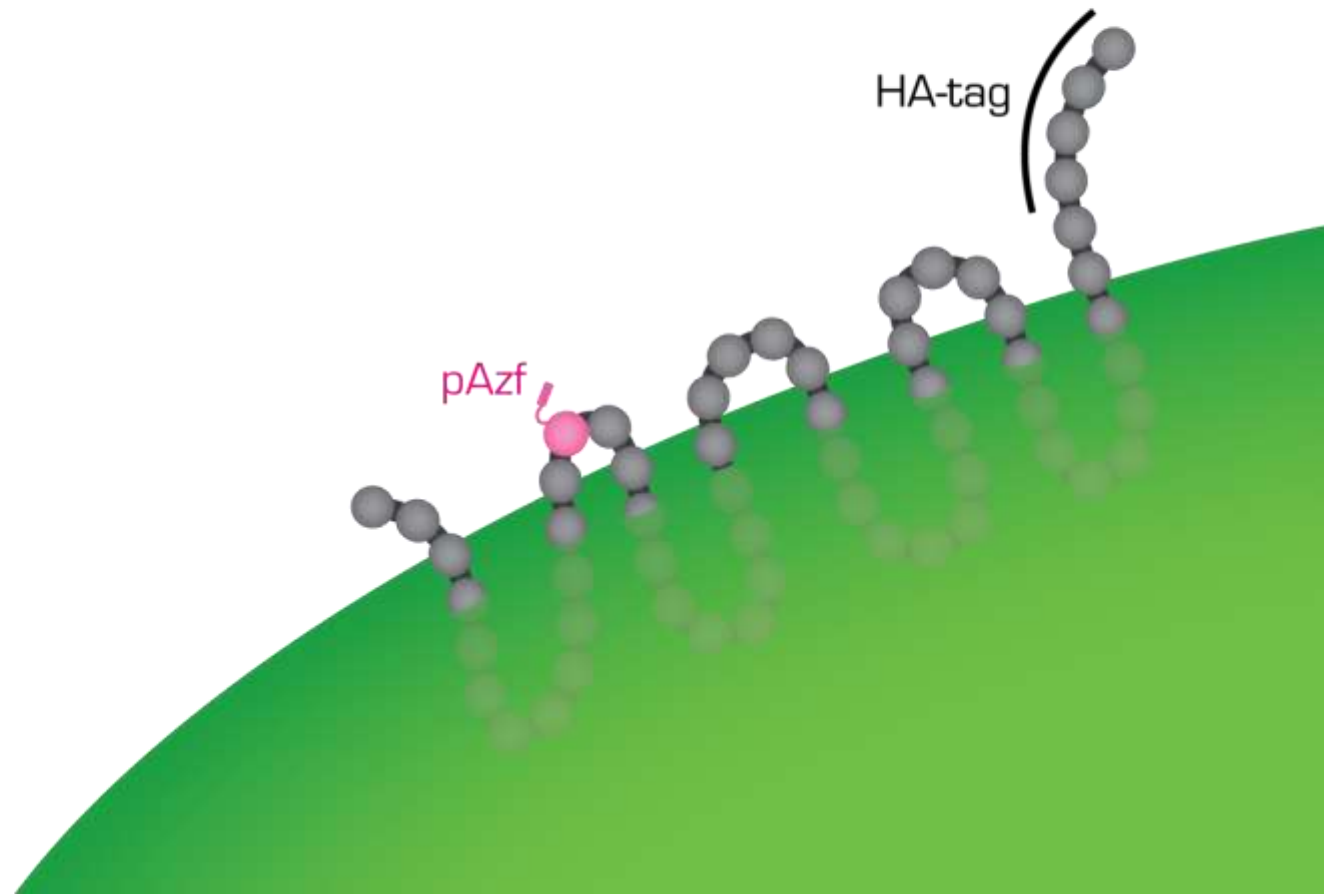




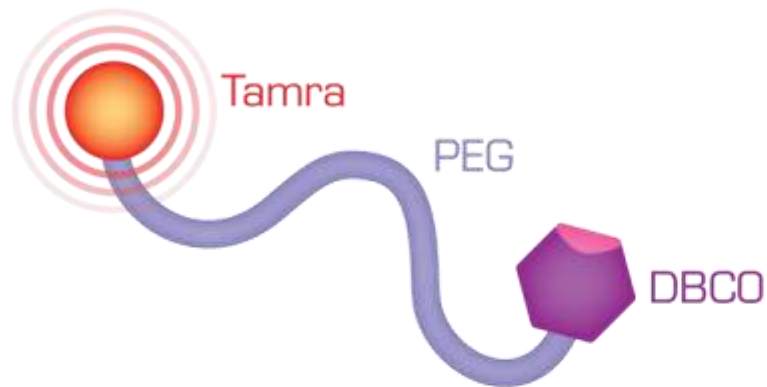
# Transport naar membraan



# Klikbaar Membraan Eiwit

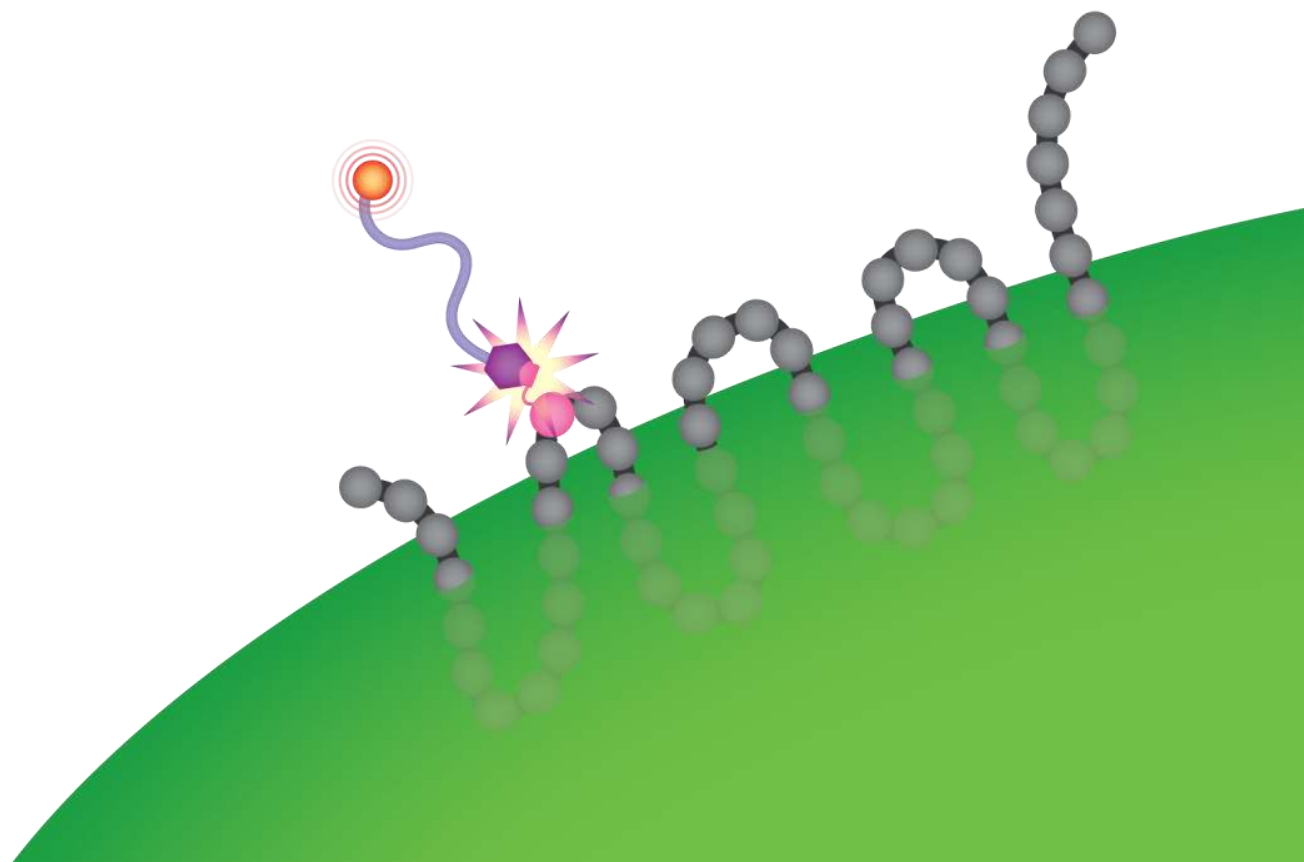


# Klikbare stof toevoegen

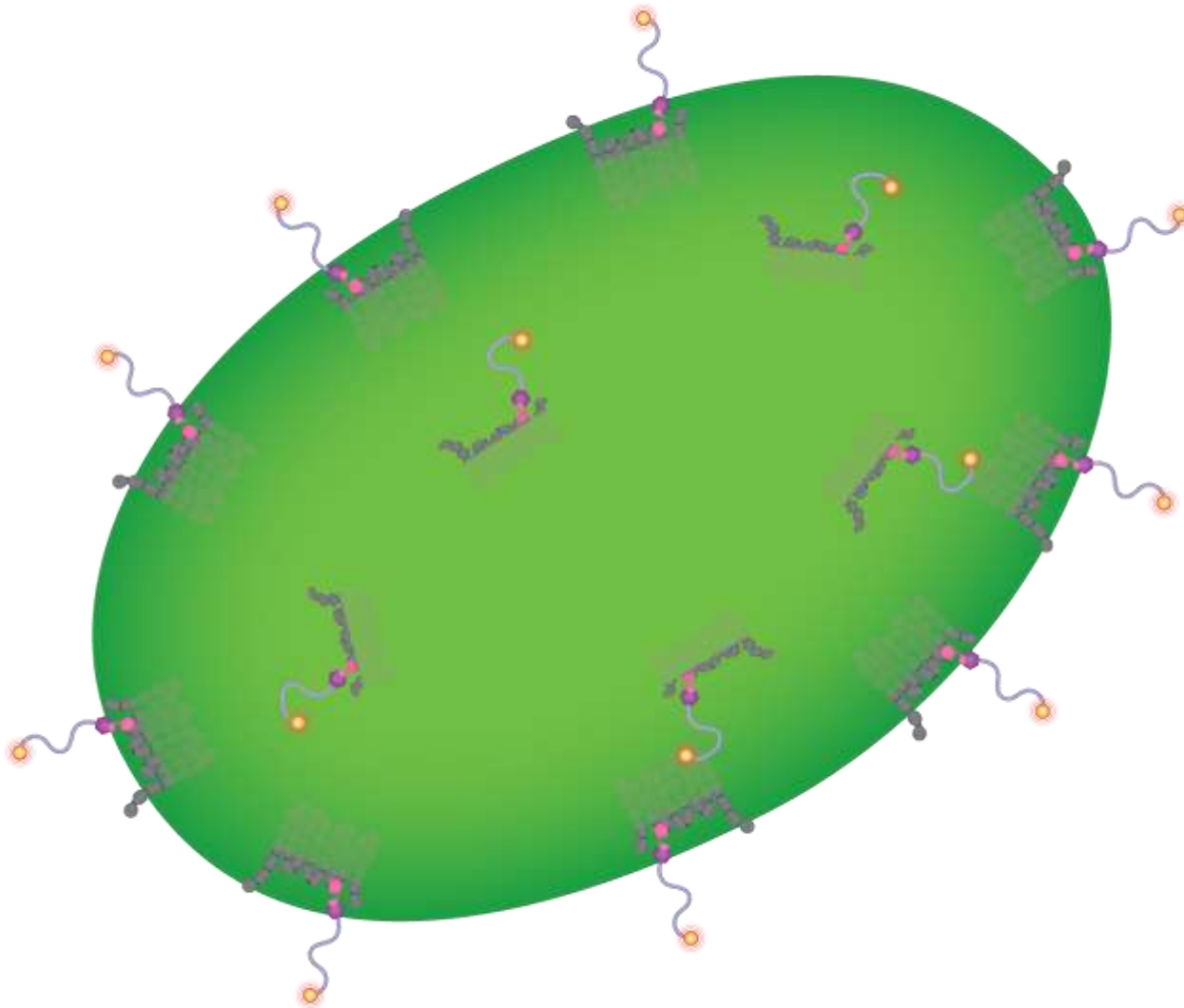




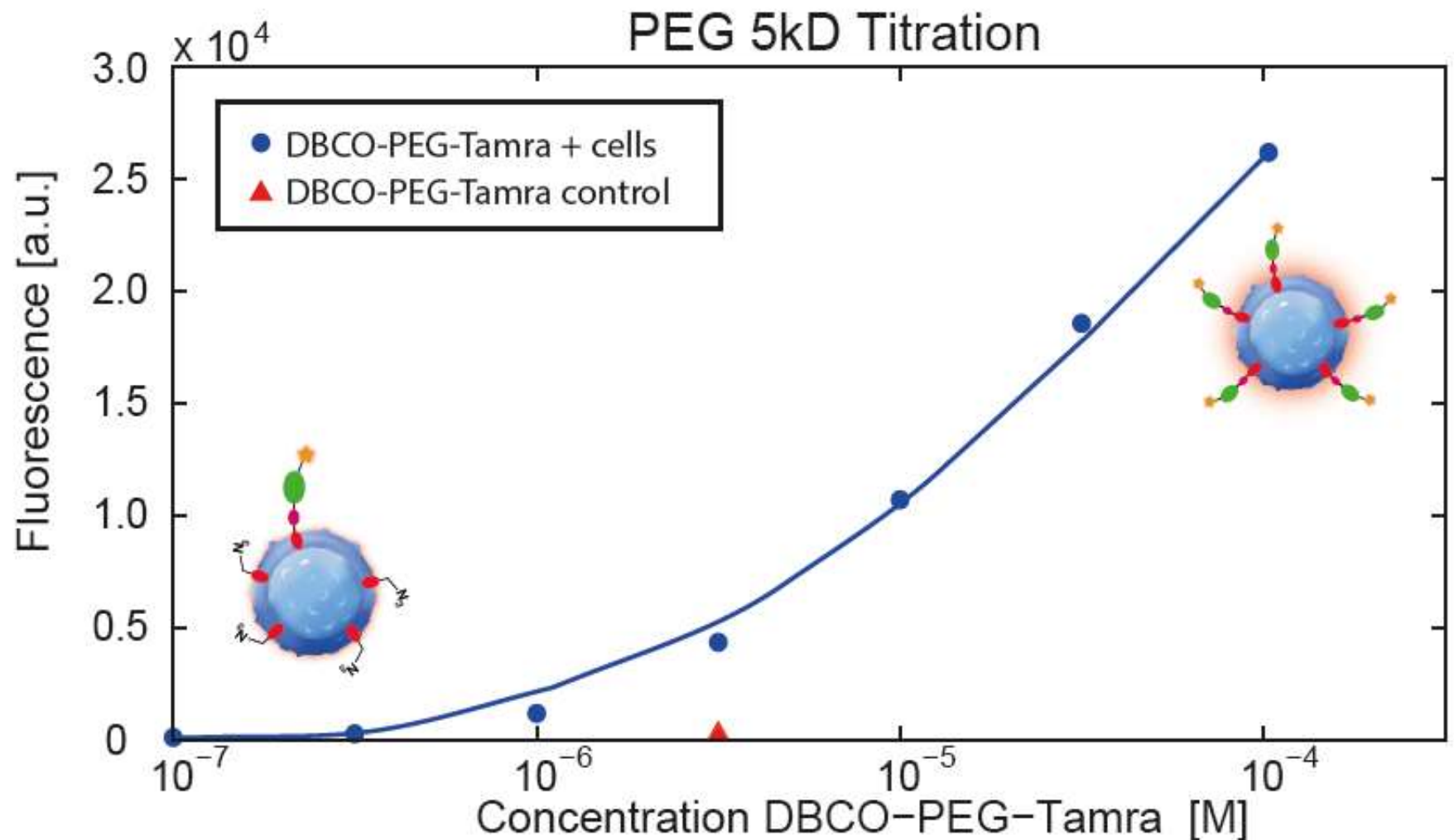
# Click!



# Resultaat



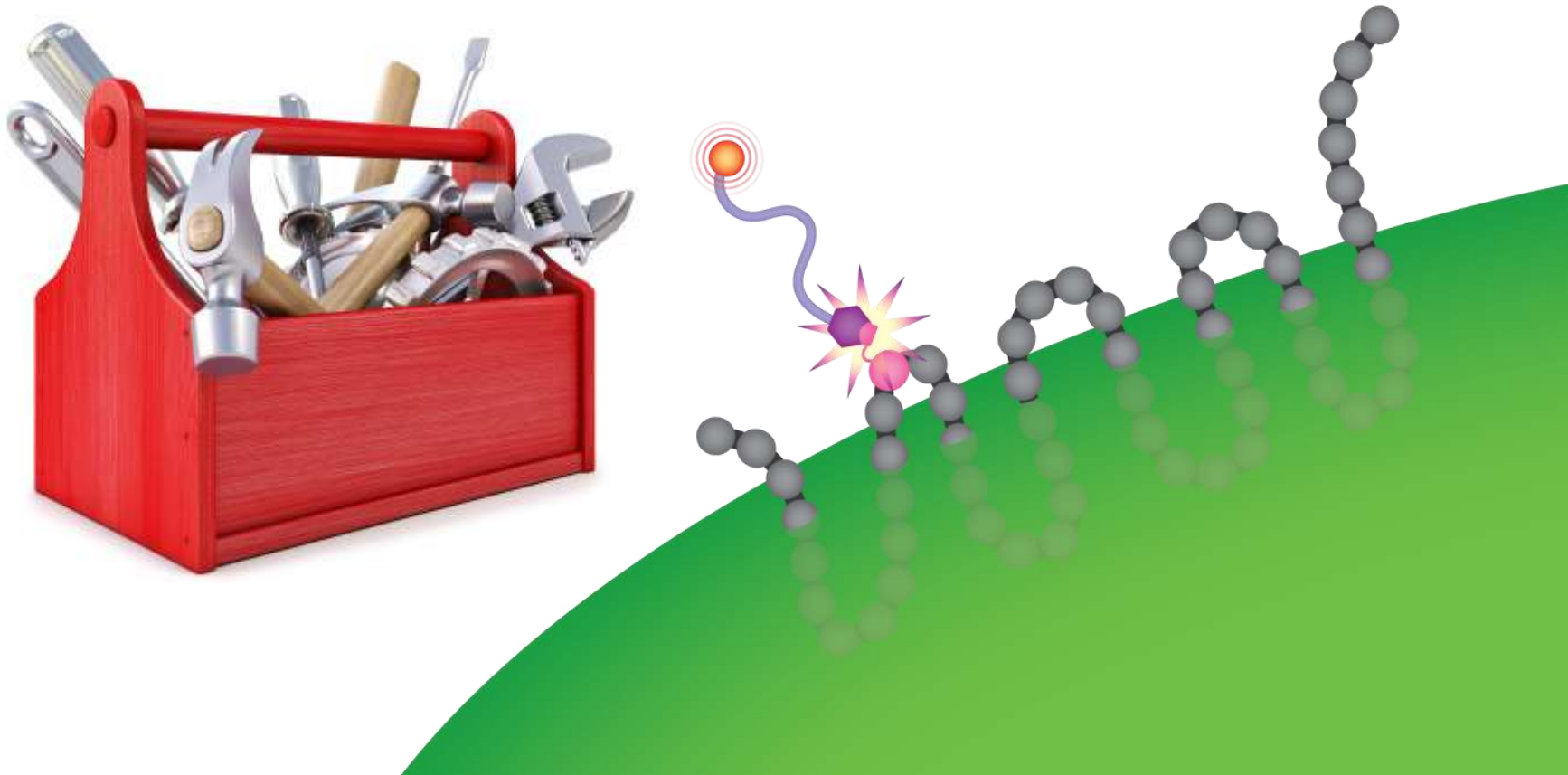
# FACS om fluorescentie te meten





# Click systeem

- Elke wensbare chemische stof kan aan het membraan van de bacterie geklikt worden.

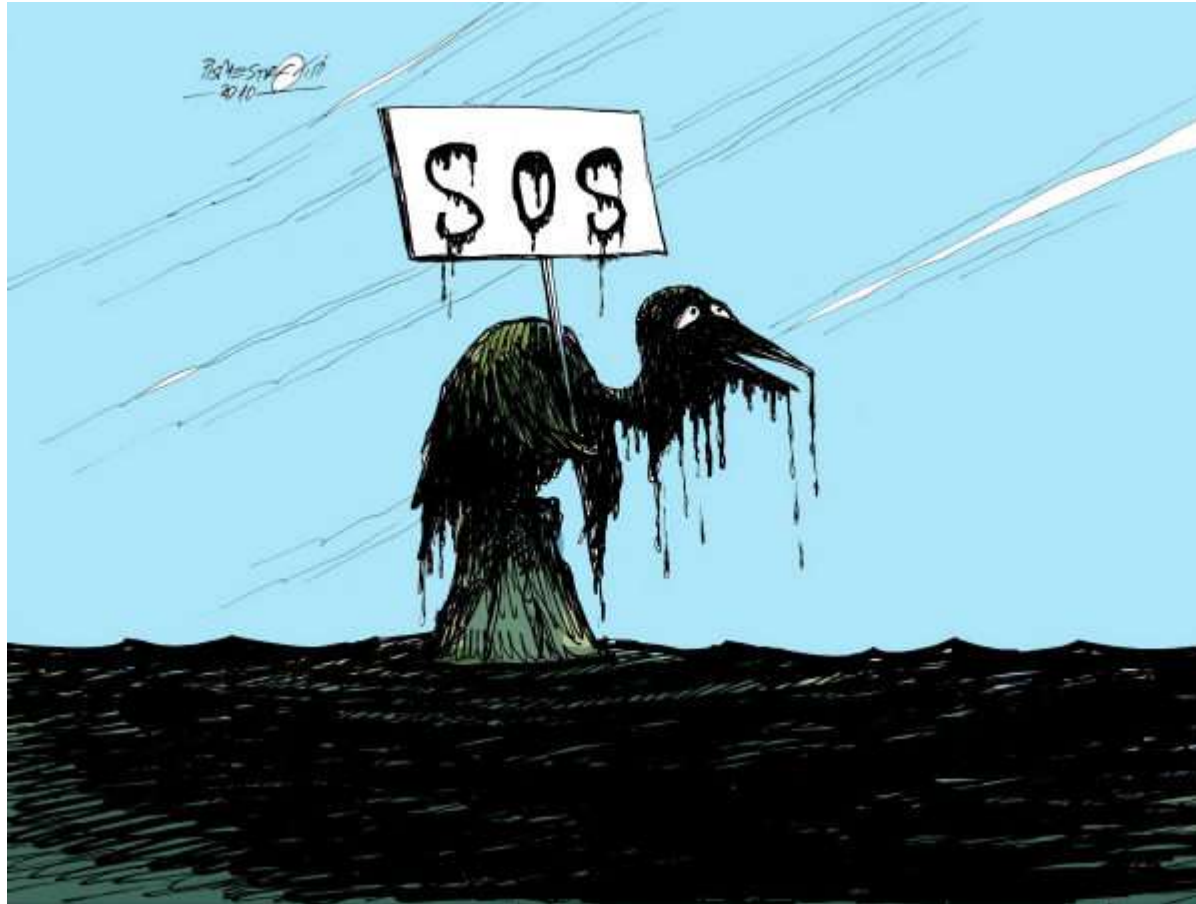


# Wat kun je er nu mee?

- **Toepassing is afhankelijk van molecuul dat aan het membraan wordt gebonden**
- **Immobilisatie van cellen**
- **Cellen clusteren**
- **Eiwitten klikken aan cellen**
- **Etc**

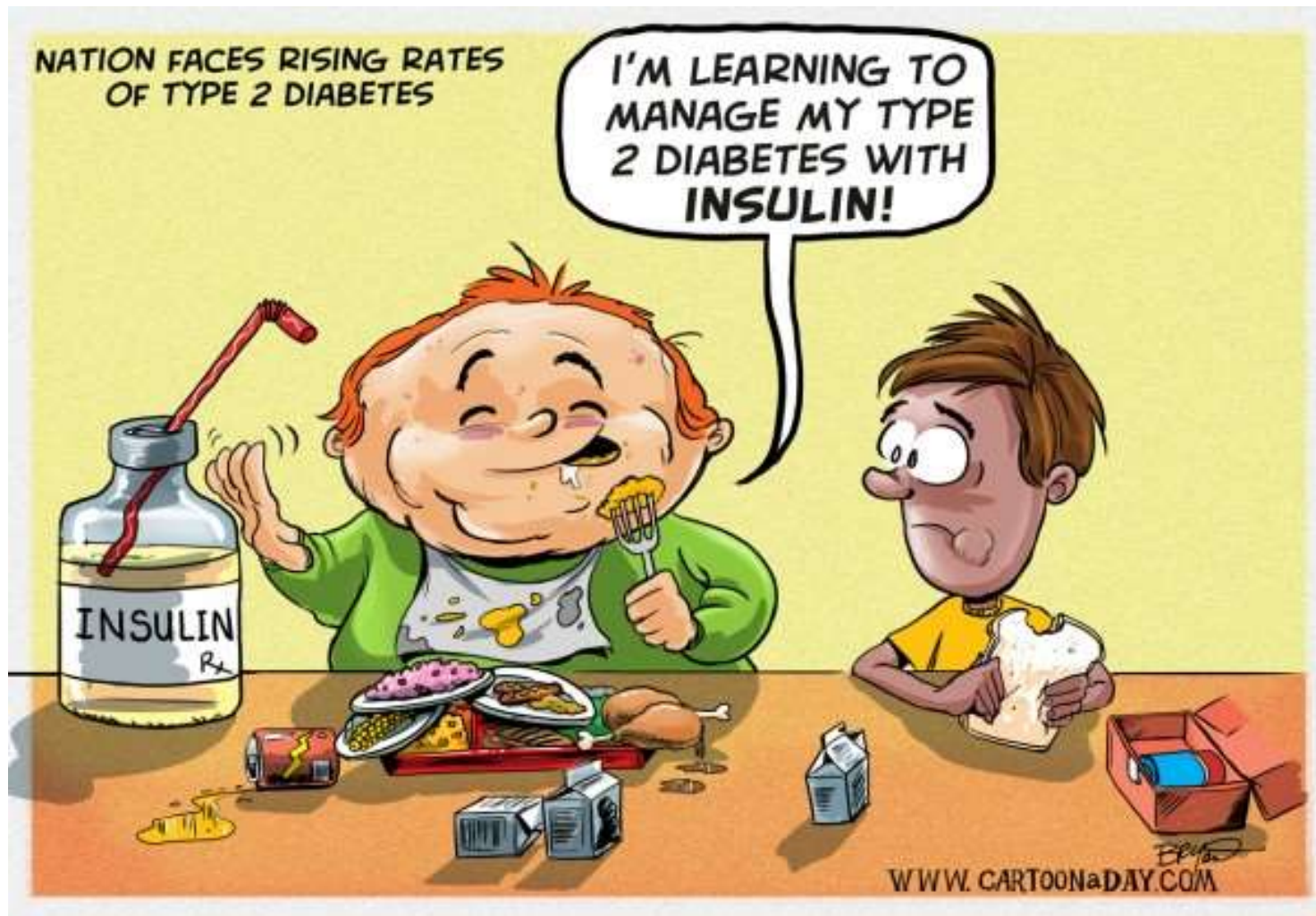


# Scenario: olieramp



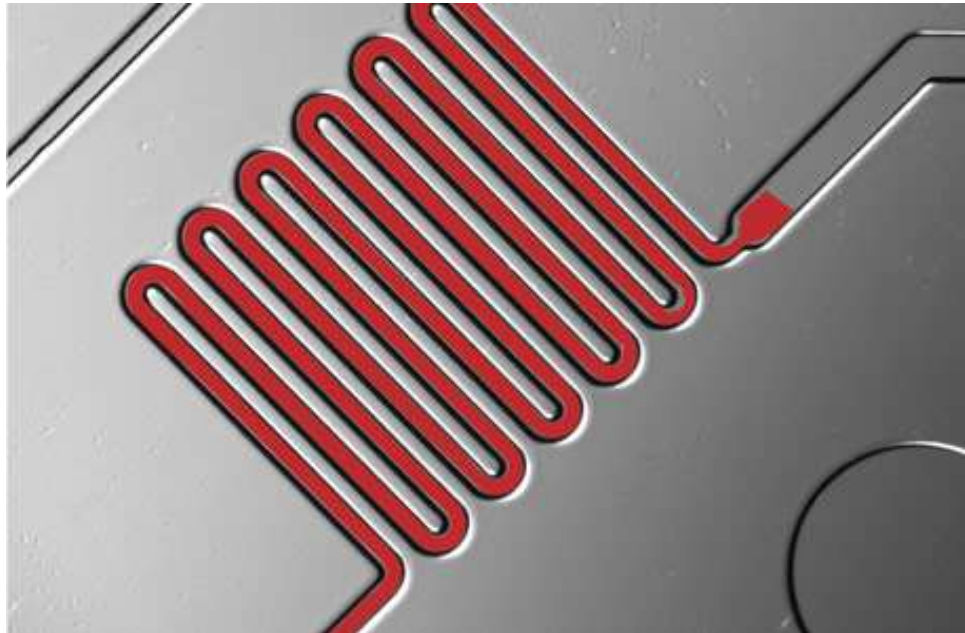


# Scenario: immuunsysteem



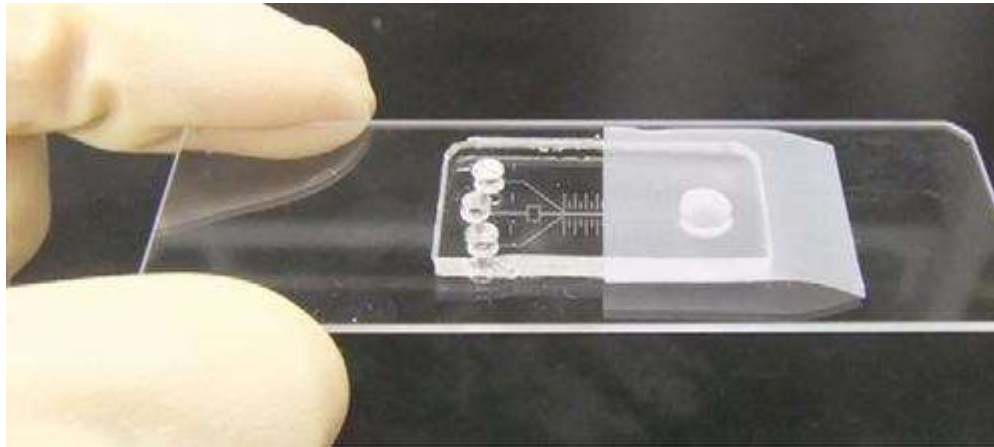
# Toepassen van Click Systeem

- **Microfluidics**
- **Geoptimaliseerde werkbank**



# Wat is microfluidics?

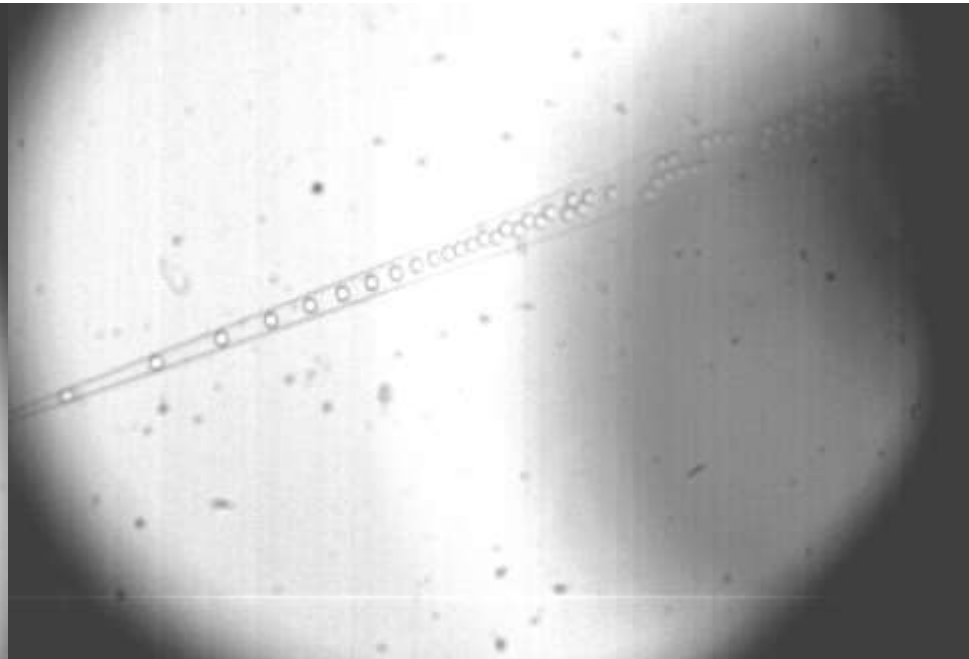
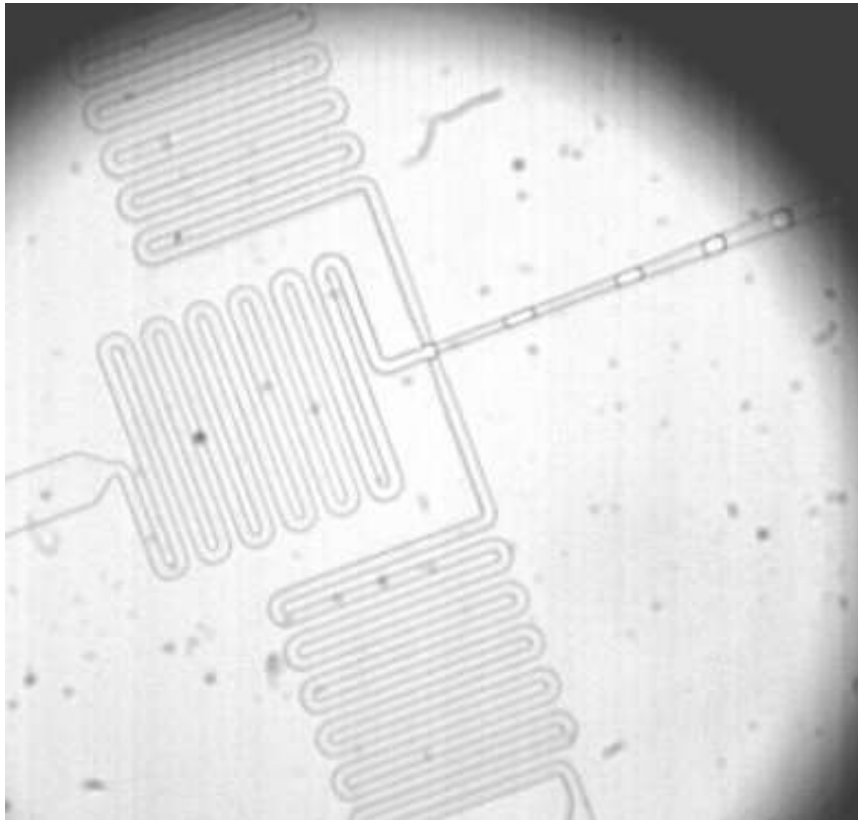
- Lab-on-chip technology
- Schaal: mm-cm





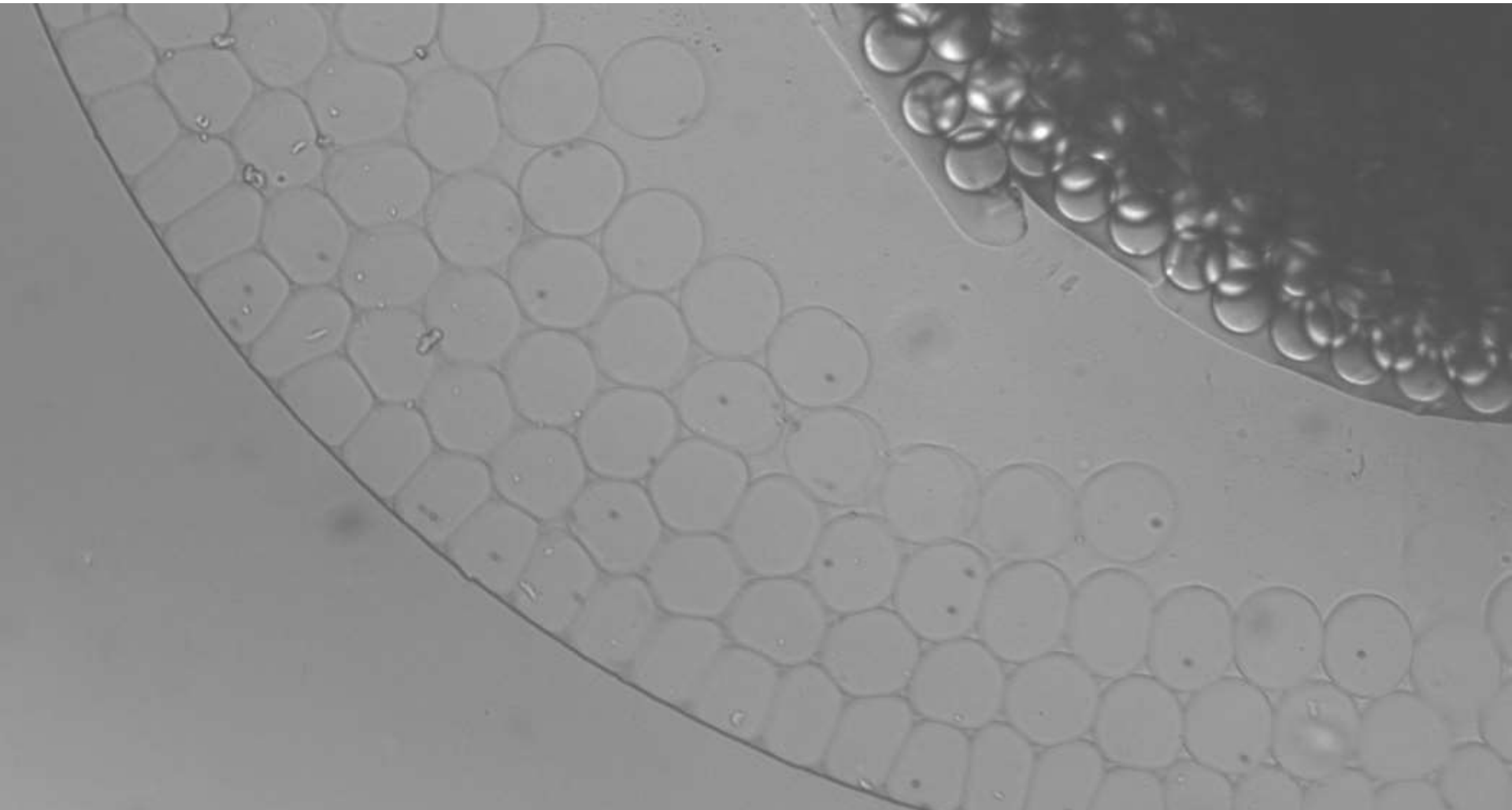
# Toepassing van microfluidics

- **Vormen van microdruppels (water in olie)**



# Toepassing van microfluidics

- **Encapsuleren van cellen**



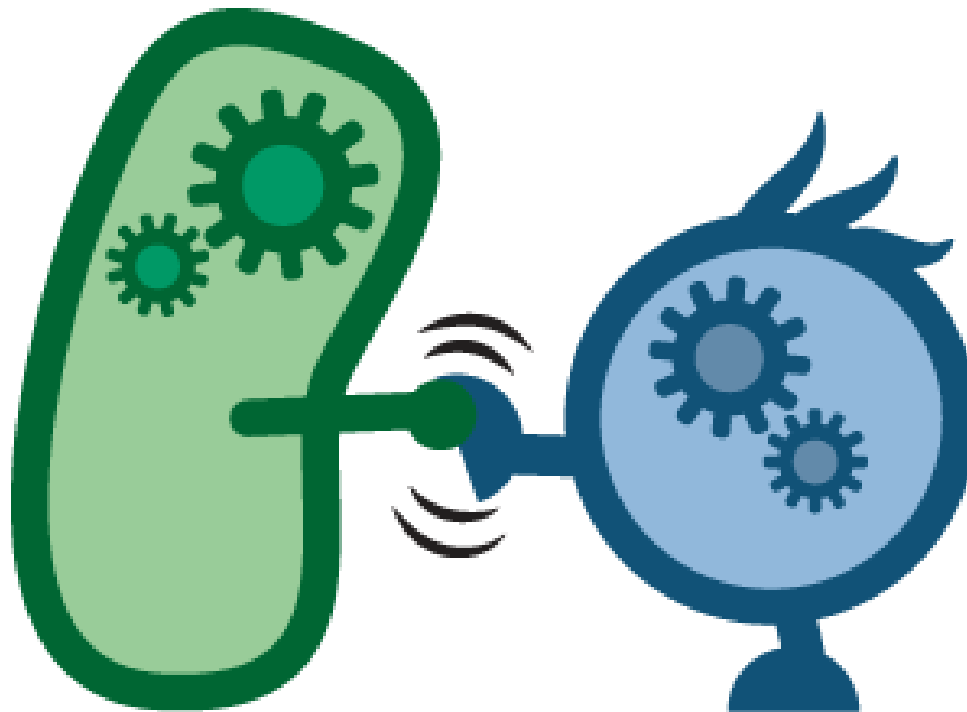
# Voordelen microfluidics

- Precies 1 bacterie per druppel
- Geen celclustering
- Gecontroleerde omgeving
- Precieze controle hoeveelheid stof



# Human Practices

- Openheid over synthetische biologie
- Mogelijkheden en risico's





# Kinderboek



# Bacterie



# Genetisch Gemodificeerd Organisme (GMO)



# iGEM TU/e





# Wij willen graag bedanken...

**TU/e** Technische Universiteit  
Eindhoven  
University of Technology

**Institute for Complex  
Molecular Systems**

**Universiteitsfonds  
Eindhoven**

 **GenScript**  
Make Research Easy



**SnapGene®**  
Software for molecular biology

 **Jena Bioscience**



**DOPHARMA**  
VETERINAIRE FARMACIA

**MERIAL**  
A SANOFI COMPANY



... en natuurlijk jullie!



**Namens het iGEM team TU Eindhoven 2014**

